2022 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: June, 2022

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Report Reference Number	808597-WOOD-RP-OA-00001_P01.01
Date	June 2022

Executive Summary: Air Quality in Our Area

Air Quality in Medway

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas[1,2].

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

Medway Council is a unitary authority which is situated in Kent in the South East of England. Medway is the largest single conurbation in the southeast, outside of London, and serves a population of approximately 280,000 people. The area is predominantly urban and includes the towns of Chatham, Gillingham, Rainham, Rochester and Strood. It also includes industrial areas and port facilities, including Thamesport and the Hoo Peninsula.

Medway is recognised as part of the developing Thames Gateway Region, and is an area of significant regeneration. It is well served by transport links to London by the M2 motorway and the A2 trunk road. A network of subsidiary routes connects with other towns and small centres of population across Kent. The north Kent rail link connects Medway to London and the south coast, and the Channel Tunnel Rail Link passes through the district.

The main source of air pollution in the district is road traffic emissions from major roads, notably the M2, A2, A228, A229, A230 and A289. Medway suffers from significant congestion, particularly in the town centres. Other pollution sources, including

[1] Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

[2] Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

[3] Defra. Air quality appraisal: damage cost guidance, July 2021

[4] Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

commercial, industrial and domestic sources, also contribute to background pollution concentrations.

Nitrogen dioxide (NO_2) is the main pollutant of concern within Medway, with concentrations of all other pollutants measured being below the relevant Air Quality Objectives (AQOs).

Medway has declared four Air Quality Management Areas (AQMAs) (Central Medway AQMA, High Street Rainham AQMA, Pier Road Gillingham AQMA and Four Elms Hill Chattenden AQMA), all for exceedances of the annual mean NO_2 AQO. Further details of these AQMAs are available at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=157. Medway Council has developed an Air Quality Action Plan (AQAP) (Medway Council, 2015), which includes measures to improve the air quality within Medway. An AQAP for Four Elms Hill AQMA is currently being developed, however it has been delayed with permission by Defra to coincide with the release of the new Medway Local Plan. Consultation has taken place in Spring 2022 and adoption is expected to take place during 2022. In 2018 Medway Council developed the Air Quality Communications Strategy; this plan details a series of recommended communications activities and is designed to support the Medway AQAP.

In 2021, exceedances of the NO_2 annual mean AQO were recorded at one location within Four Elms Hill AQMA, and at two locations within Central Medway AQMA. However, a downward trend in annual mean concentrations can be observed at most monitoring locations including those within the AQMAs. Concentrations recorded in 2020 were significantly lower than usual due to reduced traffic during the Covid-19 lockdown periods. 2020 concentrations should therefore not be used for comparison.

There were no exceedances of the AQOs for particulate matter (PM_{10}). Concentrations of PM_{10} and $PM_{2.5}$ decreased when compared with 2019 concentrations at Chatham roadside automatic monitoring site, however concentrations remain stable at Rochester background automatic monitoring site. Concentrations of sulphur dioxide (SO_2) also complied with the relevant AQOs.

Medway Council actively manages air quality within its area through the Medway Local Plan (2003) Policy BNE24 ‘Air Quality’, to ensure that new developments do not exacerbate existing air quality issues. A new Local Plan is currently under development and will be used in the future to manage air quality. The Council also uses the technical guidance document ‘Medway Air Quality Planning Guidance’, issued by the Council in 2016, to deal with planning applications that could impact air quality. Additionally, the

Council works to manage local air quality through the implementation of the Medway AQAP and supporting Medway Air Quality Communications Strategy. Medway Council is also working with Public Health colleagues to prioritise action on air quality in its area to help reduce the health burden from air pollution.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy[5] sets out the case for action, with goals to reduce exposure to harmful pollutants. The Road to Zero[6] sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

The Medway AQAP sets out a list of measures that Medway Council will implement to improve air quality within Medway. Medway Council has taken forward measures during the current reporting year of 2021 in pursuit of improving local air quality. Some of the key progress in 2021 are that the full Council endorsed the Kent and Medway Energy and Low Emissions Strategy (KMELES)[7] in January 2021. Subsequently a "living" Climate Change Action Plan has been developed, using the KMELES as a framework, and was approved by Cabinet on 8 June 2021. A key focus of the Climate Change Action Plan will be a reduction in emissions from transport. This will serve to reduce air pollution from vehicles and by doing so improve air quality in Medway.

Medway is preparing an AQAP for the Four Elms Hill AQMA and expects that it will be adopted in Autumn 2022.

[5] Defra. Clean Air Strategy, 2019

[6] DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

[7] https://www.kent.gov.uk/about-the-council/strategies-and-policies/environment-waste-and-planning-policies/environmental-policies/kent-and-medway-energy-and-low-emissions-strategy

Conclusions and Priorities

Many challenges still lie ahead for Medway Council in terms of making a positive contribution to improving air quality. A trend of decreasing measured concentrations of NO_2 is apparent at most sites from 2011 to 2021. However, exceedances of the NO_2 annual mean concentrations are still observed at monitoring sites with Central Medway and Four Elms Hill AQMA. No changes to the number and / or extent of the AQMAs are recommended at this stage.

The AQMA declared at Gillingham has consistently recorded concentrations below the AQO, it is recommended that the AQMA remain in place due to ongoing development at Chatham Docks.

Road transport is the dominant source of pollution within Medway's AQMAs, and reducing road traffic emissions is, therefore, the key air quality priority. Another significant challenge is accommodating the large demand for development in Medway. This is likely to put existing areas of poor air quality under additional pressure and could negate the actions that the Council is implementing to improve air quality. For this reason, continuing the implementation of the Medway Air Quality Planning Guidance is a high priority, prior to the adoption of a new Local Plan for Medway (currently under development and expected to be adopted in 2022).

Medway Council's priorities for the coming year are to continue with the work on the measures outlined in the AQAP (detailed in Table 2.2), as well as the submission of the Four Elms Hill AQAP. Progress on measures included within the Four Elms Hill AQAP will be reported in next year's ASR.

Local Engagement and How to get Involved

Medway Council has developed the Medway Air Quality Communication Strategy, which the Council uses to manage local engagement and to gauge the current level of public interest and understanding of air quality.

Members of the public can help to improve air quality in Medway by using sustainable transport options, such as walking, cycling and using public transport. Medway Council encourages people to car share whenever possible, and the Council has a database for commuter car sharing (https://liftshare.com/uk/community/km).

Further information on local air quality can be obtained from the Kent Air website

(http://www.kentair.org.uk/).

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Medway Council with the support and agreement of the Medway Air Quality Steering Group.

If you have any comments on this ASR please send them to the Environmental Protection Team at:

environmental.protections@medway.gov.uk

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1 Local Air Quality Management

This report provides an overview of air quality in Medway during 2021. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an AQMA and prepare an AQAP setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Medway Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

2 Actions to Improve Air Quality

Air Quality Management Areas

AQMAs are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an AQAP within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Medway Council can be found in Table 2.1. The table presents a description of the four AQMAs that are currently designated within Medway. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs. All of the AQMAs have been declared with respect to the NO_2 annual mean AQO. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=157

The air quality objectives pertinent to the current AQMA designations are as follows:

- NO_2 annual mean;

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by National Highways?	Level of Exceedance: Declaration ($\mu g/m^3$)	Level of Exceedance: Current Year ($\mu g/m^3$)	Name and Date of AQAP Publication	Web Link to AQAP
Central Medway AQMA	29/06/2010	NO_2 Annual Mean	A large central AQMA which includes previous AQMAs and new areas	YES	58.4	31.4	Air Quality Action Plan 2015	https://www.medway.gov.uk/downloads/file/1982/medway_air_quality_action_plan_2015
Rainham AQMA	29/06/2010	NO_2 Annual Mean	An area running along the High Street in Rainham	YES	52.9	30.5	Air Quality Action Plan 2015	https://www.medway.gov.uk/downloads/file/1982/medway_air_quality_action_plan_2015
Gillingham AQMA	29/06/2010	NO_2 Annual Mean	An area along Pier Road in Gillingham	YES	52.7	29.1	Air Quality Action Plan 2015	https://www.medway.gov.uk/downloads/file/1982/medway_air_quality_action_plan_2015
Four Elms Hill AQMA	01/11/2017	NO_2 Annual Mean	Part of Four Elms Hill, Chattenden	YES	52.0	37.5	Four Elms Hill AQAP is in preparation. Consultation has taken place in Spring 2022. The AQAP is predicted to be adopted in Autumn 2022.	

☒ **Medway Council confirm the information on UK-Air regarding their AQMA(s) is up to date**

☒ **Medway Council confirm that all current AQAPs have been submitted to Defra**

Progress and Impact of Measures to address Air Quality in Medway

Defra's appraisal of last year's ASR concluded that robust and accurate QA/QC procedures were applied in the 2021 ASR and it was recognised that Medway Council has a proactive and detailed approach to improving air quality across Medway.

Medway Council has taken forward a number of direct measures during the current reporting year of 2021 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 34 measures are included within Table 2.2, with the type of measure and the progress Medway Council have made during 2021 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in the AQAP (2015). The key completed measures during 2021 relates to Measure No 33. The full Council endorsed the Kent and Medway Energy and Low Emissions Strategy (KMELES)[8] in January 2021. Subsequently a "living" Climate Change Action Plan has been developed, using the KMELES as a framework, and was approved by Cabinet on 8 June 2021. A key focus of the Climate Change Action Plan will be a reduction in emissions from transport. This will serve to reduce air pollution from vehicles and by doing so improve air quality in Medway. Progress against the plan will be monitored quarterly and the plan updated every year.

Further details of the key objectives and outcomes of the Climate Change Action Plan are listed below, and can be found at the following location: https://www.medway.gov.uk/climatechangeplan

- Medway Council will continue to contribute to the county-level version of the UK Climate Change Risk Assessment (CCRIA) which is being led by Kent County Council (KCC). It is Medway Council's responsibility to identify gaps and opportunities to build a climate resilient Medway over the next few years.
- In April 2019 Medway Council declared a Climate Emergency and the Climate Change Action Plan (2021) commits Medway Council to this declaration. The

[8] https://www.kent.gov.uk/about-the-council/strategies-and-policies/environment-waste-and-planning-policies/environmental-policies/kent-and-medway-energy-and-low-emissions-strategy

declaration passed a motion to commit to reducing the districts carbon footprint and providing the local community with a clean, green future and to be a place people want to work and live which has a sustainable future. The declaration also commits Medway Council to establish a clear action plan for Medway to deal with climate change, setting out an achievable and clear timeline.

- The Climate Change Action Plan (2021) sets out 11 priority areas for the next five years. There is an aim to develop a joint Kent and Medway approach to achieving a reduction in carbon emissions.

Over the course of the next reporting year, Medway expects to have completed the AQAP for Four Elms Hill AQMA. Measures and progress associated with the Four Elms Hill AQAP will be presented in next year's ASR.

The principal challenge and barrier to implementation that Medway Council anticipates facing is security of funding, and this has led to various measures progressing slower than expected during 2020.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Review Regional Freight Strategy	Freight and Delivery Management	Other	2017	2020	Medway Council Transport & Parking and Kent County Council	n/a					5%	Completed or not	Complete.	
2	HGV route optimisation	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	2017	2020. Ongoing for life of plans under no.1 above.	Medway Council Transport & Parking and Kent County Council	n/a						Completed or not	Ongoing. Tackled through no.1 above.	
3	HGV Sat Nav review	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	2017	2020. Ongoing for life of plans under no.1 above.	Medway Council Transport & Parking and Kent County Council	n/a						Completed or not	Ongoing. Tackled through no.1 above.	
4	Monitor % HGV's through AQMA's	Freight and Delivery Management	Other		Ongoing	Medway Council Transport & Parking, DfT							Completed or not	HGV flows are not monitored by Medway Council. However, DfT data are available for a number of locations on the Medway road network, and includes locations within/near to AQMA's. Ongoing analysis of HGV traffic flow data could be used to determine effectiveness of no.1-3 above, and whether further intervention/review is required.	Relies on continued monitoring by DfT
5	Investigate the feasibility of a Quality Bus Partnership (or equivalent) with the local bus operator	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services		2021	Medway Council Transport & Parking	n/a						Completed or not	No progress has been made during 2021	Relies on support from local bus operator and Medway council.
6	Increase proportion of Euro V, and subsequent (or equivalent) buses in fleet	Vehicle Fleet Efficiency	Vehicle Retrofitting programmes		Ongoing	Medway Council Transport & Parking	External funding required for vehicle retrofit/renewal					5%	Annual fleet status.	No progress has been made during 2021	Operator investment budgets. External funding is likely to be required to support the smaller bus operators in renewal/retrofit ng of their vehicle fleets.
7	Increase bus patronage	Promoting Travel Alternatives	Other		Ongoing	Medway Council Transport & Parking							Annual bus patronage figures	No progress has been made during 2021	

8	Improve bus flow and reliability	Transport Planning and Infrastructure	Bus route improvements		Ongoing	Medway Council Transport & Parking	Bus infrastructure improvements currently delivered through internal budgets.						Number of bus infrastructure improvements	No progress has been made during 2021	Reliant on continued budget provision for improvements to be made.
9	Review taxi licensing conditions	Promoting Low Emission Transport	Taxi Licensing conditions		2021/22	Medway Council Licensing	External funding secured through DfT funded programmes.						Completed or not	The Environmental Protection Team submitted an application under the DEFRA Air Quality Grant Programme to carry out a taxi and private hire ULEV feasibility study informed by a remote sensing emissions measurement campaign.	Funding required for ULEV feasibility study/policy analysis.
10	Annual audit of taxi fleet	Promoting Low Emission Transport	Other		2022	Medway Council Licensing	External funding secured through DfT funded programmes.						Percent ULEV in annual audit of taxi fleet	The Environmental Protection Team submitted an application under the DEFRA Air Quality Grant Programme to carry out a taxi and private hire ULEV feasibility study informed by a remote sensing emissions measurement campaign.	Funding required for ULEV feasibility study/policy analysis.
11	Carry out maintenance of E-mote system to protect asset for future use	Traffic Management	Other		Unknown	Medway Council Transport & Parking						8-10%	Completed or not	No action is being proposed at present to progress this measure. The e-motes have not been operative for several years since a pilot project was carried out in Medway. There are currently no plans, or funding available to carry out maintenance of the system.	No budget is available for this measure. The E-mote system would also have to be progressed beneficial traffic management tool for this measure to be
12	Annually report number and location of roadworks in or around AQMA's	Traffic Management	Other		Ongoing	Medway Council Transport & Parking	n/a						Completed or not	No further action is proposed as this is not a SMART indicator. However, a Street Works Permit scheme was introduced by the Council in January 2017 as a traffic management tool to reduce the disruption caused by work on the highway. Contractors are required to obtain a permit before work commences, and day of the week/time restrictions are in place for Traffic Sensitive Streets, where permits will only be issued where there is to be compliance with the time restrictions. Time restrictions may include weekend, off peak and/or night time working hours. The scheme covers all roads in Medway.	Ongoing implementation of permit scheme required.
13	Report AADT annually	Traffic Management	Other		Ongoing	Medway Council Transport & Parking							Completed or not	No progress has been made during 2021	Regular reporting of internal indicators required.

															Relies on continued monitoring by DfT.
14	Link ANPR vehicle class data to provide detailed source apportionment to support feasibility study work	Traffic Management	Other		Ongoing	Medway Council Transport & Parking							Completed or not	No progress has been made during 2021	Regular reporting of internal indicators required. Relies on continued monitoring by DfT.
15	Promoting and monitoring cycling and walking	Promoting Travel Alternatives	Promotion of cycling		Ongoing	Medway Council Sustainable Transport Team	n/a					1%	Medway mode of travel data	Existing active travel to school initiatives encompasses a package of schemes as referenced under Measure 16. A number of these campaigns include data collection opportunities to help monitor modal shift progress. Cycle count data is monitored, with approximately 20 counters located across Medway. Our Cycling Action Plan concluded some time ago now, however officers are currently working with consultants [Systra] to develop a Local Cycling and Walking Infrastructure Plan 'LCWIP' under the DfT Capability Fund opportunity, awarded in 2021, in addition to a number of other active travel revenue workstreams, including ROWIP actions and public health collaboration. Officers are also progressing a scheme on Four Elms Hill as part the DfT Active Travel Fund Tranche 2 works and hope to consider other active travel schemes in conjunction.	
16	Develop and continue walk or cycle to school scheme and events	Promoting Travel Alternatives	School Travel Plans		Ongoing	Medway Council Sustainable Transport Team	n/a						Number of schools participating	The Council continues to work in partnership with the KM Charity Team to promote walking and cycling to school initiatives. The Walking Bus initiative relaunched in 2021, following the easing of social distancing and Covid-related restrictions. Other initiatives include Walk Once a Week 'WOW', Bikeability, The Big Pedal [since renamed to the Big Walk and Wheel], Bike Week, Walk2Count Challenge, Hedgehog Hike and The Social Netwalk, often coinciding with national focus campaigns. We also have a five-year Sustainable School Travel Strategy in place and have been	

														successful in securing government funding to progress further active travel initiatives as part of the DfT Capability Fund.	
17	Develop and continue healthy walk scheme and cycle scheme	Promoting Travel Alternatives	Promotion of cycling		Ongoing	Medway Council Supporting Healthy Weight Team	n/a						Number of individuals involved	Medway Public Health continues to deliver a range of complementary active travel initiatives to encourage more active lifestyles through the Supporting Healthy Weight (Adults) team. These initiatives include walking, cycling and Nordic style walking schemes.2021/22 has seen a significant increase in the numbers taking part in Nordic Walking and now includes regular Nordic Walking sessions for Children/Families and residents with long term conditions.	
18	Run internal Eco-driving courses	Vehicle Fleet Efficiency	Driver training and ECO driving aids		Unknown	Medway Council Business Development and Environmental Protection	May require external funding to progress this measure.					<1%	Number of drivers on training courses	No progress has been made during 2021.	No budget available for this measure.
19	Engage with business to promote Eco-driving	Vehicle Fleet Efficiency	Driver training and ECO driving aids		Unknown	Medway Council Business Development	May require external funding to progress this measure.						Number of business engaged	No progress has been made during 2021	No budget available for this measure.
20	Increase ULEV component within Medway fleet	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles		Ongoing	Medway Council Procurement							Number of ULEV within Medway fleet	No progress has been made during 2021	
21	Review of Medway Procurement Policy to ensure positive support for ULEV and third party emission reduction	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles		2019/20	Medway Council Procurement	n/a						Completed or not	No progress has been made during 2021	
22	Develop and improve school travel plans	Promoting Low Emission Transport	School Travel Plans		Ongoing	Medway Council Business Development Team							Number of schools with active travel plans	90% of all schools in Medway have previously developed a school travel plan, and there is a continued requirement to produce these in accordance with planning applications that impact upon the travel and transport needs associated with school journeys.	Relies on significant changes occurring that require planning permission
23	Review and align Medway Travel Plan with AQAP	Promoting Travel Alternatives	Workplace Travel Planning		Ongoing	Medway Council Business Development Team							Completed or not	No progress has been made during 2021	

24	Develop work place travel plans	Promoting Travel Alternatives	Workplace Travel Planning		Unknown	Medway Council Business Development Team							Number of businesses with a travel plan	No progress has been made during 2021	No budget available for this measure.
25	Promote car sharing and reduce the number of trips	Alternatives to private vehicle use	Car & lift sharing schemes		Ongoing	Medway Council Environmental Protection Team	Currently being delivered through internal budgets.						Number registered on Liftshare scheme	No progress has been made during 2021	No budget available for this measure.
26	Review and re-write relevant planning policies and develop a supplementary planning document to reflect this action plan and relevant and related corporate strategies	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance		2021	Medway Council Planning and Environmental Protection	n/a						Number of relevant policies reviewed and re-written that are beneficial to air quality	The AQ planning guidance was revised in 2021 to update sections on national planning policy and the calculation of damage costs for mitigation schemes. Draft policies on transport and air quality have been drafted, but due to the delay on the local plan, have not yet been published.	Requires implementation and recording of policy on decision notices.
27	Improve and then maintain awareness of the health and financial impacts of air pollution to all stakeholder groups; businesses, schools, public, vulnerable groups, members, and internal managers	Public Information	Other		Ongoing	Medway Council Environmental Protection Team	Currently being delivered through internal budgets.						Number of notifications and consultations carried out	The Air Quality Communication Strategy facilitates increasing public awareness of the impacts of poor air quality on health. Methods of effective communication to stakeholders specified in the AQCS are followed by Medway Council. Medway worked with other Kent local authorities during 2021 on joint campaigns, including Clean Air Day, and to produce materials and resources that support the Strategy. The Public Health team supports the Air Quality agenda with School based initiatives such as the Green School Awards and through its healthy school award programme which also recognises environmental and promotion of air quality action and messaging. The team are also supporting local NHS colleagues with targeted communication work to support individuals with long term health conditions in adults. As well as participating in a focused pathway review of Asthma in children.	
28	Development of promotional material to support Eco- driving within businesses	Vehicle Fleet Efficiency	Other		Unknown	Medway Council Environmental Protection, Public Health and Communications	May require external funding to progress this measure.					<1%	Number of press releases, reports on websites, presentations delivered, workshops delivered and leaflets dropped	No progress has been made during 2021	

29	Develop an air quality communications strategy with public relations team	Public Information	Other	2018	2018	Medway Council Communications and Environmental Protection	Delivered through internal budgets.						Completed or not	Complete.	
30	Set up AQAP Steering Group and book 6 monthly meetings with stakeholders	Policy Guidance and Development Control	Other policy	2016	Ongoing	Medway Council Environmental Protection							Completed or not	Complete. The Air Quality Steering Group did not meet during 2021, however measures continued to be progressed.	
31	Engage with business, internal members and managers as priority	Public Information	Via other mechanisms		Unknown	Medway Council Communications and Environmental Protection	n/a						Number of events and presentations where the AQAP has been represented	We have continued to promote the Kent Realising Electric Van Scheme (REVS) to business in Medway via social media platforms, business support newsletter and literature. The scheme provides businesses with an opportunity to try an electric van for 2 months for free. The aim is that participating organisations will see the benefits and ease of owning and running an EV. 10 Businesses in Medway took part in the scheme in 2021.	
32	Integrate, where appropriate, AQAP target into internal service plans	Policy Guidance and Development Control	Other policy		Ongoing	Medway Council Performance Hub and Environmental Protection	n/a						Number of service plans with AQAP related actions included	The AQAP features in the Environmental Protection Team service plan. Work required to identify if appropriate to integrate AQAP into other service plans going forward. No progress to report during 2021.	
33	Identify corporate policies and strategies where consultation of changes is requested and notify accountable department	Policy Guidance and Development Control	Other policy		Ongoing	Medway Council Environmental Protection	n/a						Number identified	Full Council endorsed the Kent and Medway Energy and Low Emissions Strategy in January 2021. Subsequently a "living" Climate Change Action Plan has been developed, using the KMELES as a framework, and was approved by Cabinet on 8 June 2021. A key focus of the Climate Change action plan will be a reduction in emissions from transport. This will serve to reduce air pollution from vehicles and by doing so improve air quality in Medway. Progress against	

														the plan will be monitored quarterly and the plan updated every year.	
34	Develop business case for evaluation or quantification studies to take forward 2016-2017	Other	Other		Ongoing	Medway Council Environmental Protection	External funding may be required on a case by case basis.						Completed or not	See above updates for measures 9 and 10.	Budget constraints. Staff resources.

$PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Contained within the AQAP are a variety of measures that are aimed at managing emissions from road traffic. Measures intended to tackle road traffic pollution emissions (including $PM_{2.5}$ emissions) include a variety of traffic management measures, freight and delivery management measures, transport planning and infrastructure measures, vehicle fleet efficiency measures, measures to promote travel alternatives and alternatives to private vehicle use and measures to promote low emission transport. Other measures being implemented by Medway Council, including the establishment of the Medway Air Quality Steering Group, the development and implementation of new air quality planning guidance, local enterprise partnership funding, activity supporting walking and cycling and public health initiatives, will also help to reduce concentrations of $PM_{2.5}$ within Medway.

Medway Council also support the Local Transport Plan for Kent (2017) and has developed a Local Plan which the Council is in the process of updating; both of these plans include measures aimed at improving air quality through the management of road traffic, which will have a positive impact on concentrations of $PM_{2.5}$.

Medway Council is part of the Kent Health and Wellbeing Board, which works to improve public health through tackling key health issues (including poor air quality). In addition, the Kent and Medway Air Quality Partnership (K&MAQP) aims to tackle air pollution across the County and works with Public Health colleagues to prioritise action on air quality in its area, taking into consideration the PHOF, which includes an indicator based on the effect of $PM_{2.5}$ on mortality (indicator 3.01).

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

This section sets out the monitoring undertaken 2021 by Medway Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2017 and 2021 to allow monitoring trends to be identified and discussed.

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Medway undertook automatic (continuous) monitoring at two sites in 2021. Table A.1 in Appendix A shows the details of the automatic monitoring sites. The https://kentair.org.uk/ website presents automatic monitoring results for Medway Council, with automatic monitoring results also available through the UK-Air website .

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Medway Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 46 sites during 2021. Table A.2 in Appendix A presents the details of the non-automatic sites.

Four new monitoring sites were deployed in 2021:

- DT47 and DT48 were deployed due to concerns highlighted by modelling carried out for the Lower Thames crossing and potential local air quality impacts on this key corridor form the M20; and
- DT49 and DT50 were deployed in October 2021 following concerns raised by local residents about potential air quality impacts related to the Housing Infrastructure Fund (HIF) roads scheme.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including

bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.1.3 Nitrogen Dioxide (NO_2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2021 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Table A.5 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

Measured concentrations at both automatic monitoring sites were below the annual mean AQO in 2021. There were also no measured exceedances of the 1-hour AQO in 2021 by either of the automatic monitoring sites. Furthermore, measured annual mean concentrations at all diffusion tube monitoring sites were below 60 µg/m^3, indicating that an exceedance of the 1- hour mean objective is unlikely.

Exceedance of the annual mean NO_2 AQO were recorded in 2021 at the following locations:

- DT03 and DT06, within Central Medway AQMA; and
- DT24 within Four Elms Hill AQMA.

There is an increase in concentrations at most monitoring locations in 2021 compared to 2020, however this is due to untypical low concentrations recorded in 2020 associated with the Covid-19 lockdown period. Concentrations recorded in 2020 should therefore not be used for comparison.

Ignoring 2020 concentrations, a downward trend in annual mean concentrations can be observed at most monitoring sites since 2017.

3.1.4 Particulate Matter (PM_{10})

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the air quality objective of 40µg/m^3.

Table A.7 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

Measured concentrations at both monitoring sites were well below the annual and 24-hour mean AQOs in 2021, and the number of daily means above 50µg/m^3 also decreased compared to 2019.

At Chatham roadside monitoring site, a downward trend in annual mean concentration has been observed since 2017. At Rochester background monitoring site, annual mean concentration have been stable at approximately 15 µg/m^3 since 2019.

The PM monitoring equipment at the Chatham site was changed from an FDMS TEOM to a BAM at the end of 2016, which may have affected results.

3.1.5 Particulate Matter ($PM_{2.5}$)

Table A.8 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five years.

At Chatham roadside monitoring site, a downward trend in annual mean concentration has been observed since 2017. At Rochester background monitoring site, annual mean concentration have been stable at approximately 10 µg/m^3 since 2018.

3.1.6 Sulphur Dioxide (SO_2)

Table A.9 in Appendix A compares the ratified continuous monitored SO_2 concentrations for 2021 with the air quality objectives for SO_2.

In 2021 there were no measured exceedances of the 15-minute mean, 1-hour mean or 24-hour mean AQO for SO_2.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
CHAT	Chatham Roadside (AURN)	Roadside	577437	166993	NO_2, PM_{10}, $PM_{2.5}$	YES (3)	NO_2 - Chemiluminescent analyser, PM_{10} and $PM_{2.5}$ - BAM (FDMS previous to November 2016)	0	4	2.5
ROCH	Rochester Stoke (AURN)	Rural	583158	176314	NO_2, PM_{10}, $PM_{2.5}$, SO_2, O_3	NO	NO_2 - Chemiluminescent analyser, PM_{10} and $PM_{2.5}$ - FIDAS (FDMS previous to August 2018, SO_2 and O_3 - UV fluorescent analyser	0	N/A	2.5

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable

Table A.2 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT01	60 High Street, Rainham	Roadside	581568	165952	NO_2	YES	0.0	2.5	No	2.3
DT02	High Street, Strood (Tanning studio)	Roadside	573482	169282	NO_2	YES	0.0	2.5	No	2.5
DT03	46 High Street, Strood (Heating shop)	Roadside	573793	169164	NO_2	YES	0.0	2.1	No	2.5
DT04	30-32 Luton Road (Funeral Directors)	Roadside	576565	167336	NO_2	YES	0.0	2.9	No	2.5
DT05	27 High Street, Luton	Roadside	577426	166506	NO_2	YES	0.0	2.0	No	2.5
DT06	18 Star Hill	Roadside	574589	168087	NO_2	YES	0.0	3.3	No	2.5
DT07	92 Cuxton Road, Strood	Roadside	573078	168908	NO_2	YES	0.0	4.2	No	2.2
DT08	Railway Street, Chatham	Roadside	575642	167779	NO_2	YES	0.0	5.5	No	3.0
DT09	Chatham AQ station	Roadside	577434	166993	NO_2	YES	0.0	3.3	Yes	2.5
DT10	Flat, 4 New Road, Chatham	Roadside	575681	167691	NO_2	YES	0.0	8.2	No	4.0
DT11	High Street, Chatham (Orbit Housing)	Roadside	576393	167495	NO_2	YES	0.0	3.1	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT12	28 Frindsbury Road	Roadside	573865	169646	NO_2	YES	0.0	3.1	No	2.1
DT13	Stoke AQ station	Rural	583152	176305	NO_2	YES	0.0	N/a	Yes	2.5
DT15	Lamp post adjacent White Horse pub, 95 High Street, Rainham	Roadside	581709	165922	NO_2	YES	1.0	2.4	No	2.5
DT16	Care home, 117 High Street, Rainham	Roadside	581843	165886	NO_2	YES	0.0	4.9	No	2.5
DT17	Lamp post adjacent 159 Rainham Road, Gillingham (Canterbury Street junction)	Roadside	577768	166922	NO_2	YES	2.8	1.9	No	2.5
DT18	Lamp post adjacent 4b Luton Road (Luton Arches junction)	Roadside	576508	167404	NO_2	YES	1.0	1.8	No	2.5
DT19	5 London Road, Strood (Dentist)	Roadside	573329	169294	NO_2	YES	0.0	2.5	No	2.5
DT20	Lamp post adjacent 33 London Road, Strood	Roadside	573168	169305	NO_2	YES	6.7	1.7	No	2.0
DT21	88 Spire Way, Wainscott	Roadside	574999	170882	NO_2	YES	0.0	29.0	No	2.2

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT22	Joy Lodge, Four Elms Hill	Roadside	575488	171616	NO_2	YES	0.0	12.0	No	1.2
DT23	1 Omaha Place, Wainscott	Roadside	575044	171351	NO_2	NO	0.0	34.0	No	2.1
DT24	Sign post RS106 adjacent 1A Main Road, Chattenden	Kerbside	575948	171847	NO_2	YES	2.2	0.5	No	2.6
DT25	Lamp post PAS23 adjacent 2A Pier Road	Roadside	577908	169285	NO_2	YES	0.4	3.3	No	2.3
DT26	Lamp post PAS512 adjacent 24 Pier Road	Roadside	578007	169262	NO_2	YES	6.8	2.6	No	2.4
DT27	Lamp post PAS22 adjacent Liberty Quays, Pier Road	Roadside	577880	169319	NO_2	YES	4.6	3.8	No	2.4
DT28	Lamp post NDL49 adjacent 9 New Road, Chatham	Roadside	575737	167670	NO_2	YES	6.4	1.0	No	2.5
DT29	Lamp post NDJ4 adjacent Trinity College, New Road Avenue	Roadside	574760	167892	NO_2	YES	6.1	2.9	No	2.5
DT30	Lamp post NDK6 adjacent Tuition Centre, New Road Avenue/Manor Road junction	Roadside	575473	167837	NO_2	YES	0.0	3.1	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT31	7 Highview Drive, Chatham	Roadside	574788	164568	NO_2	YES	0.0	8.4	No	2.5
DT32	Lamp post FEA016 adjacent 6 Balls Cottages, Main Road, Chattenden	Roadside	575903	171802	NO_2	YES	8.4	1.9	No	2.4
DT33	Lamp post FEA20 adjacent 2 Broadwood Road, Chattenden	Roadside	575971	171833	NO_2	YES	2.4	1.8	No	2.6
DT34	Lamp post CP019, Corporation Street	Roadside	574499	168495	NO_2	YES	N/A	2.6	No	1.8
DT35	Sign post adjacent McDonalds, Commercial Road, Strood	Roadside	573518	169176	NO_2	YES	8.0	1.5	No	2.2
DT37	Lamp post adjacent former Churchills Pub, The Brook, Chatham	Roadside	575862	168104	NO_2	YES	2.4	2.4	No	2.2
DT38	Lamp post adjacent The Brook/Queen Street junction	Roadside	576056	167835	NO_2	YES	N/A	3.7	No	2.2
DT39	Lamp post adjacent Iceland,	Roadside	576084	167762	NO_2	YES	N/A	3.9	No	2.1

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
	The Brook, Chatham									
DT40	Lamp post adjacent 7 Rochester Road	Roadside	570615	166065	NO_2	NO	2.9	1.2	No	1.9
DT41	3 Formby Terrace	Roadside	570281	164949	NO_2	NO	0.0	N/A	No	1.9
DT42	Lamp post ASP3 adjacent Aspdin Close	Roadside	570276	165016	NO_2	NO	6.5	32.5	No	2.0
DT43	13 Squires Close, Strood	Roadside	570713	169417	NO_2	NO	0.0	14.1	No	2.0
DT44	Lamp post adjacent Strood Hub, High Street, Strood	Roadside	573590	169263	NO_2	YES	3.7	2.0	No	2.0
DT47	97 Rochester Road, Cuxton	Roadside	570658	166120	NO_2	NO	0	6.2	No	1.75
DT48	Sign post adjacent 2 Pilgrims Way, Cuxton	Roadside	571255	166993	NO_2	NO	0	6.0	No	2.0
DT49	Signpost adjacent 53 Higham Road, Wainscott	Roadside	574554	171351	NO_2	NO	0	2.0	No	2.0
DT50	Lamp post HKH10 Higham Road, Wainscott	Roadside	574568	171357	NO_2	NO	0	2.2	No	2.0

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
CHAT	577437	166993	Roadside	Automatic	99	25.7	25.4	23.4	18.4	19.0
ROCH	583158	176314	Rural	Automatic	96	13.3	14.7	13.0	10.2	11.0

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.**

☒ **Reported concentrations are those at the location of the monitoring site (annualised, as required), i.e. prior to any fall-off with distance correction.**

Notes:

The annual mean concentrations are presented as µg/m^3.

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Table A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2021 (%) [2]	2017	2018	2019	2020	2021
DT01	581568	165952	ROADSIDE	100.0	100.0	**45.4**	37.3	39.3	30.5	32.6
DT02	573482	169282	ROADSIDE	82.7	82.7	**43.0**	**43.8**	30.8	34.6	39.8
DT03	573793	169164	ROADSIDE	100.0	100.0	**51.0**	**46.4**	**43.6**	37.5	**40.2**
DT04	576565	167336	ROADSIDE	100.0	100.0	37.9	32.5	33.8	27.3	29.9
DT05	577426	166506	ROADSIDE	100.0	100.0	34.2	30.3	30.3	23.8	24.7
DT06	574589	168087	ROADSIDE	90.4	90.4	**51.0**	**45.9**	**47.8**	39.3	**41.3**
DT07	573078	168908	ROADSIDE	90.4	90.4	38.8	35.9	34.6	27.9	28.9
DT08	575642	167779	ROADSIDE	100.0	100.0	38.8	37.6	**40.5**	32.8	32.6
DT09	577434	166993	ROADSIDE	100.0	100.0	25.5	22.8	24.5	18.0	16.8
DT10	575681	167691	ROADSIDE	100.0	100.0	32.4	31.0	32.5	25.6	26.6
DT11	576393	167495	ROADSIDE	100.0	100.0	35.7	32.2	32.7	27.9	28.7
DT12	573865	169646	ROADSIDE	100.0	100.0	35.5	33.6	33.2	26.3	27.3
DT13	583152	176305	RURAL	100.0	100.0	13.8	13.1	13.1	10.0	12.3
DT15	581709	165922	ROADSIDE	92.3	92.3	36.0	31.8	30.8	25.3	29.2
DT16	581843	165886	ROADSIDE	92.3	92.3	28.6	24.1	24.2	18.6	21.5
DT17	577768	166922	ROADSIDE	90.4	90.4	**45.3**	**40.6**	38.8	31.2	34.1
DT18	576508	167404	ROADSIDE	73.1	73.1	**48.0**	**40.4**	**42.9**	35.7	38.8
DT19	573329	169294	ROADSIDE	100.0	100.0	**48.0**	**43.7**	**42.1**	35.9	37.2
DT20	573168	169305	ROADSIDE	100.0	100.0	**51.0**	**47.2**	**43.3**	39.1	39.8
DT21	574999	170882	ROADSIDE	92.3	92.3	22.4	21.4	19.9	21.5	17.4
DT22	575488	171616	ROADSIDE	100.0	100.0	31.0	28.0	27.2	23.4	25.9
DT23	575044	171351	ROADSIDE	100.0	100.0	25.3	29.0	24.4	19.5	19.7
DT24	575948	171847	KERBSIDE	100.0	100.0	**50.8**	**47.4**	**53.2**	**44.5**	**45.7**
DT25	577908	169285	ROADSIDE	90.4	90.4	**42.9**	37.9	35.8	29.1	27.9
DT26	578007	169262	ROADSIDE	100.0	100.0	28.1	27.9	24.4	19.0	20.5
DT27	577880	169319	ROADSIDE	55.8	55.8	39.1	35.6	34.1	26.6	31.4
DT28	575737	167670	ROADSIDE	100.0	100.0	**41.9**	**40.5**	**44.4**	31.1	33.2
DT29	574760	167892	ROADSIDE	100.0	100.0	35.4	30.5	32.5	24.9	28.5
DT30	575473	167837	ROADSIDE	90.4	90.4	38.2	36.2	34.1	27.6	31.0
DT31	574788	164568	ROADSIDE	100.0	100.0	26.5	21.6	21.0	18.0	17.4
DT32	575903	171802	ROADSIDE	100.0	100.0	**47.5**	**46.3**	**43.1**	38.9	38.1
DT33	575971	171833	ROADSIDE	100.0	100.0	**43.5**	**41.6**	**42.0**	36.6	36.9
DT34	574499	168495	ROADSIDE	67.3	67.3	37.3	38.6	36.1	26.3	25.9
DT35	573518	169176	ROADSIDE	90.4	90.4	30.2	31.5	29.4	23.2	28.3
DT37	575862	168104	ROADSIDE	100.0	100.0	N/A	31.4	33.1	23.9	29.6

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
DT38	576056	167835	ROADSIDE	100.0	100.0	N/A	30.7	29.1	24.4	26.4
DT39	576084	167762	ROADSIDE	90.4	90.4	N/A	31.1	31.5	26.0	28.5
DT40	570615	166065	ROADSIDE	92.3	92.3	N/A	N/A	43.4	33.1	32.0
DT41	570281	164949	ROADSIDE	100.0	100.0	N/A	N/A	23.1	18.9	18.1
DT42	570276	165016	ROADSIDE	82.7	82.7	N/A	N/A	18.8	14.3	14.5
DT43	570713	169417	ROADSIDE	100.0	100.0	N/A	N/A	29.4	24.6	22.7
DT44	573590	169263	ROADSIDE	100.0	100.0	N/A	N/A	48.3	31.4	39.4
DT47	570658	166120	ROADSIDE	100.0	100.0	N/A	N/A	N/A	N/A	21.3
DT48	571255	166993	ROADSIDE	100.0	100.0	N/A	N/A	N/A	N/A	32.5
DT49	574554	171351	ROADSIDE	100.0	26.9	N/A	N/A	N/A	N/A	18.8
DT50	574568	171357	ROADSIDE	26.9	26.9	N/A	N/A	N/A	N/A	17.7

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16**

☒ **Diffusion tube data has been bias adjusted**

☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction**

Notes:

The annual mean concentrations are presented as µg/m^3.

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure A.1 – Trends in Annual Mean NO_2 Concentrations

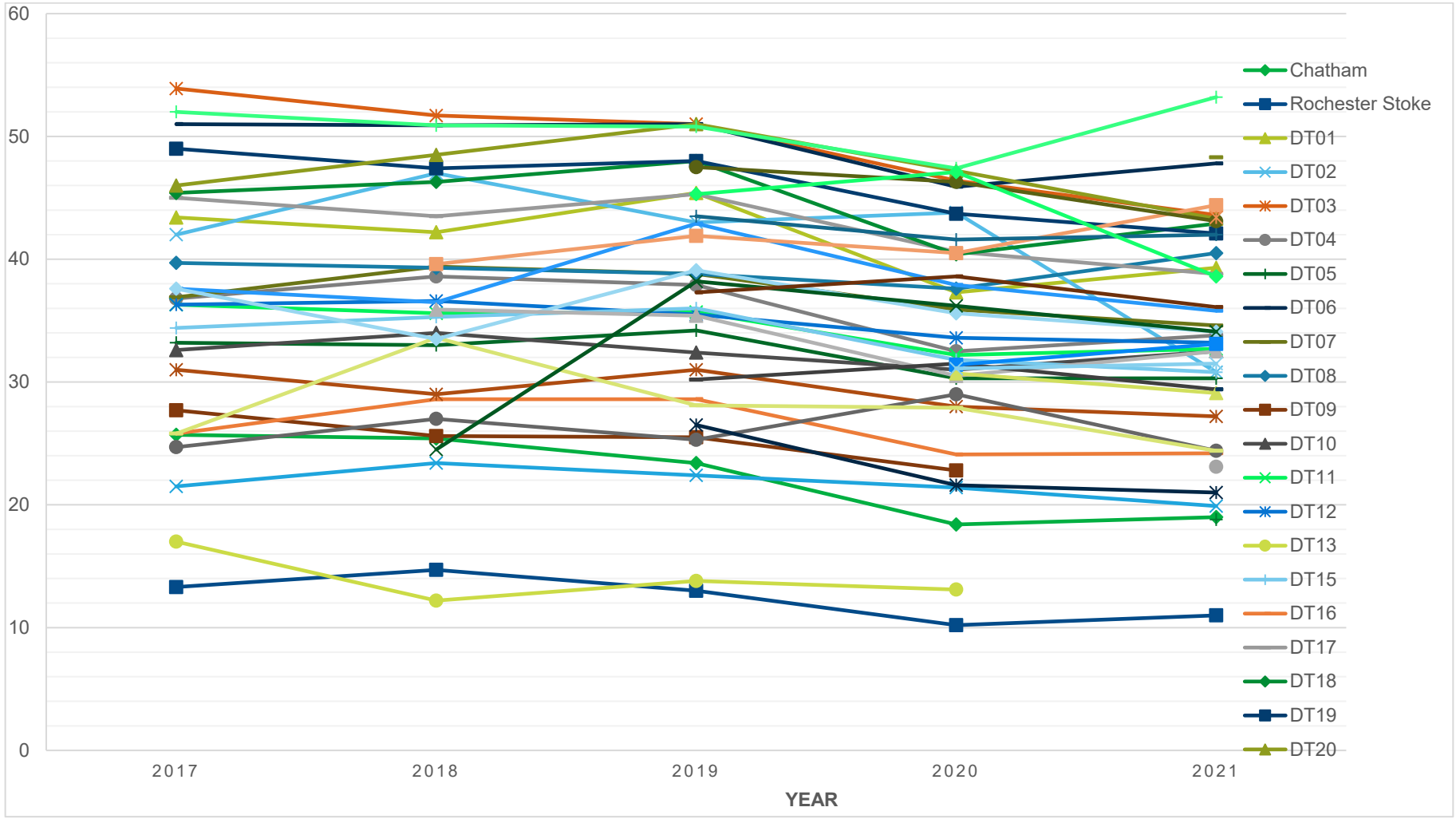


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
CHAT	577437	166993	Roadside	99.0	99.0	0	0	0	0	0
ROCH	583158	176314	Rural	96.0	96.0	0	0	0	0	0

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m^3 have been recorded.

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Table A.6 – Annual Mean PM_{10} Monitoring Results (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
CHAT	577437	166993	Roadside	97.0	97.0	21.6	23.7	23.0	22.0	17.0
ROCH	583158	176314	Rural	99.0	99.0	15.8	17.4	15.0	15.0	15.0

☐ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16**

Notes:

The annual mean concentrations are presented as µg/m^3.

Exceedances of the PM_{10} annual mean objective of 40µg/m^3 are shown in **bold**.

All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure A.2 – Trends in Annual Mean PM_{10} Concentrations

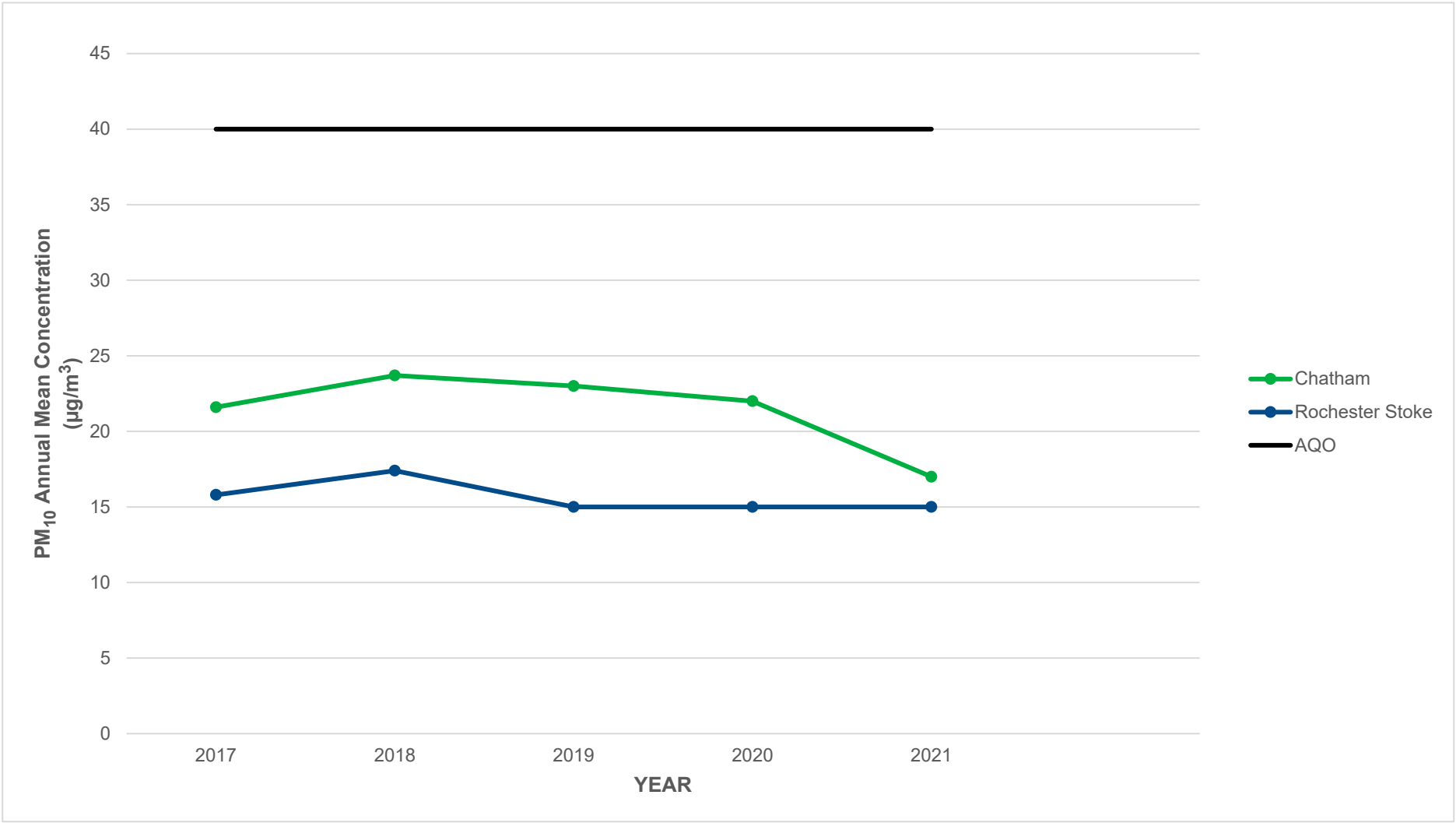


Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
CHAT	577437	166993	Roadside	97.0	97.0	7	11	14	7	0
ROCH	583158	176314	Rural	99.0	99.0	4	0	10	7	3

Notes:

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m^3 have been recorded.

Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure A.3 – Trends in Number of 24-Hour Mean PM_{10} Results > 50µg/m^3

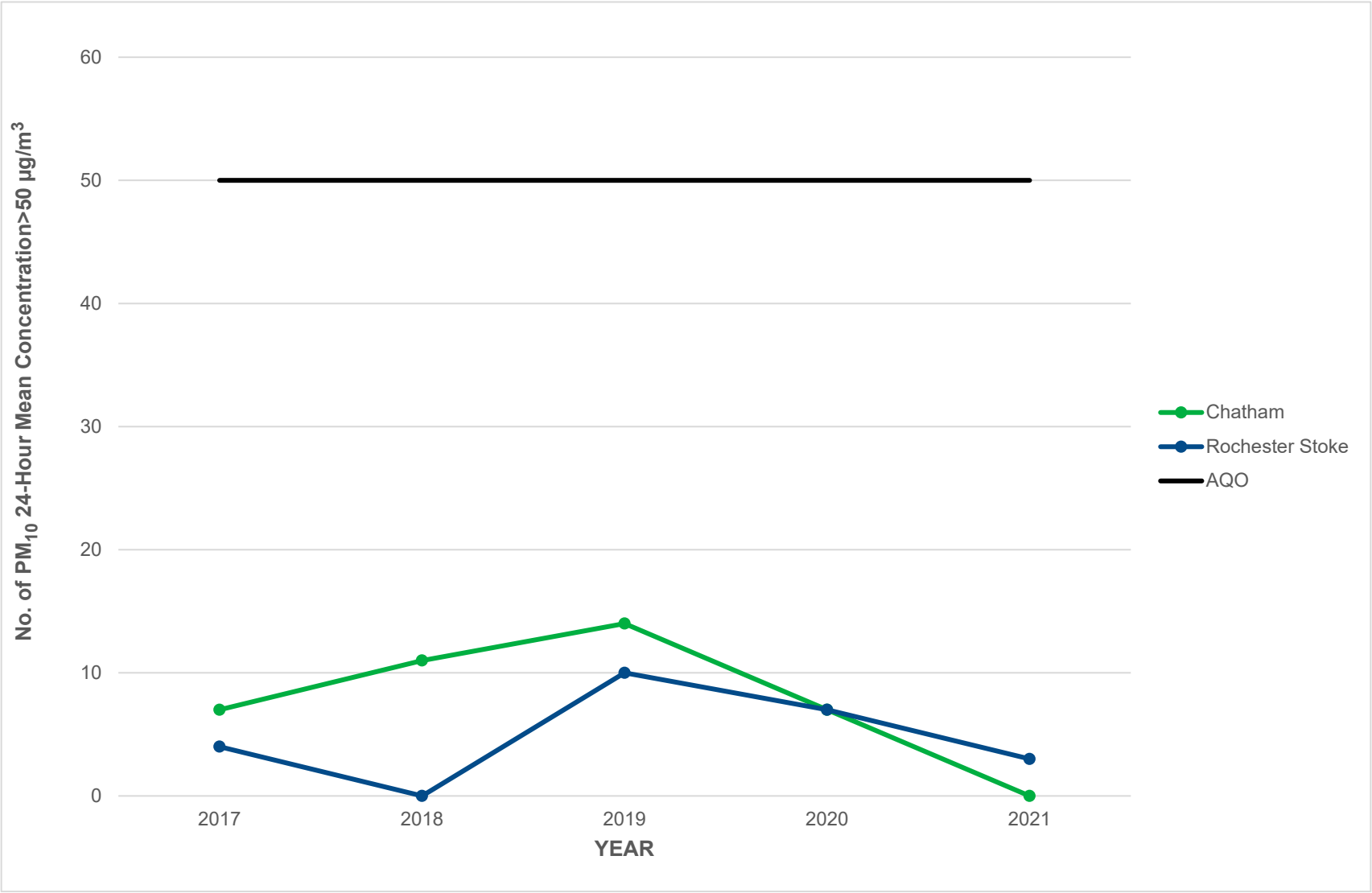


Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
CHAT	577437	166993	Roadside	95.0	95.0	14.1	15.2	13.7	11.0	12.0
ROCH	583158	176314	Rural	99.0	99.0	9.7	10.1	10.9	10.0	10.0

☐ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16**

Notes:

The annual mean concentrations are presented as µg/m^3.

All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure A.4 – Trends in Annual Mean $PM_{2.5}$ Concentrations

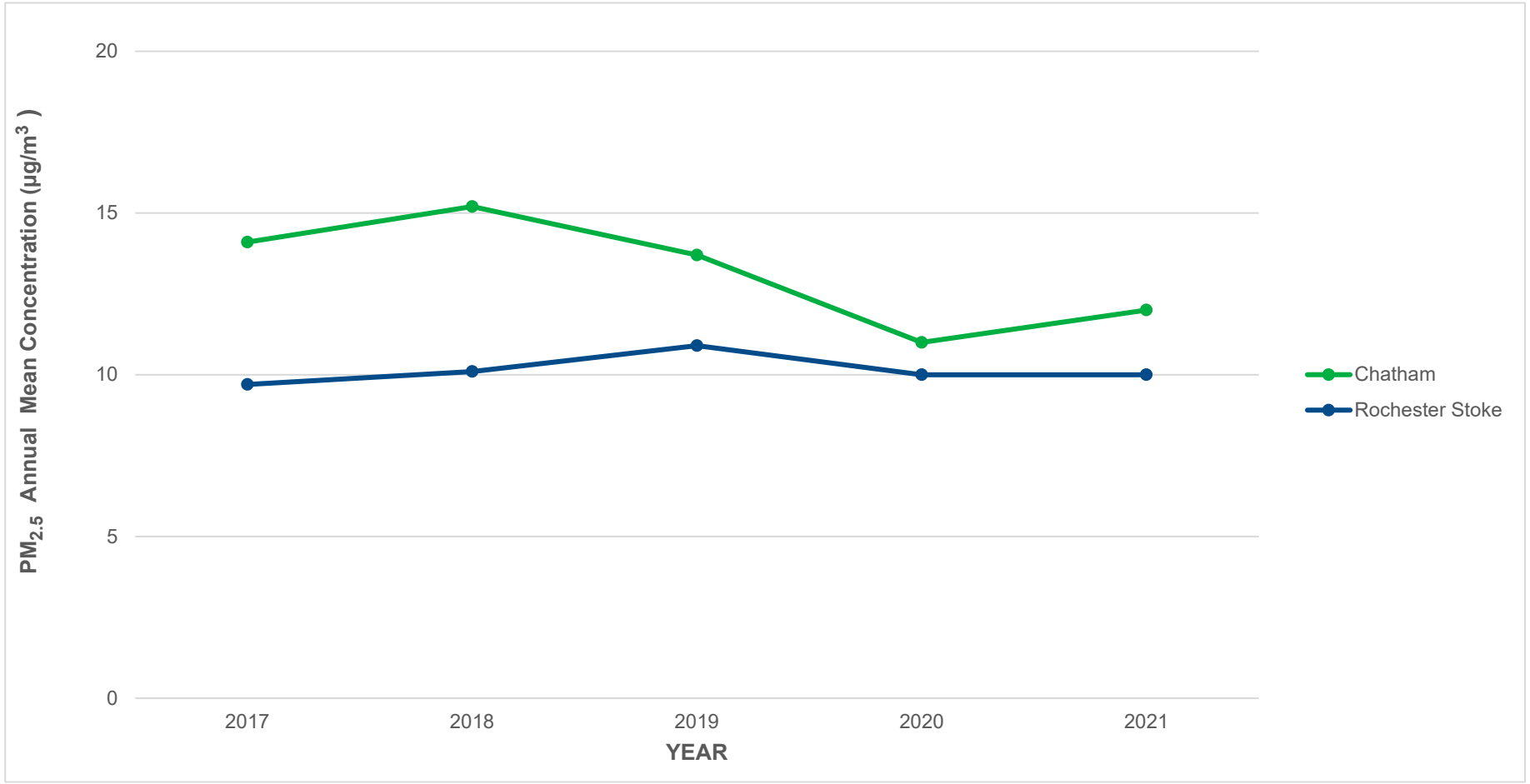


Table A.9 – SO_2 2021 Monitoring Results, Number of Relevant Instances

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	Number of 15-minute Means > 266µg/m^3	Number of 1-hour Means > 350µg/m^3	Number of 24-hour Means > 125µg/m^3
ROCH	583158	176314	Rural	82.0	82.0	0	0	0

Notes:

Results are presented as the number of instances where monitored concentrations are greater than the objective concentration.

Exceedances of the SO_2 objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year).

If the period of valid data is less than 85%, the relevant percentiles are provided in brackets.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Appendix B: Full Monthly Diffusion Tube Results for 2021

Table B.1 – NO_2 2021 Diffusion Tube Results ($\mu g/m^3$)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.78 and local factors)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT01	581568	165952	50.9	41	43.5	37.7	42	32.5	34	32.5	48.1	46.9	50	42.9	41.8	32.6		
DT02	573482	169282	49.8	48.9	52.2			56.5	49.6	40.5	58.9	46.7	57.3	49.9	51.0	39.8		
DT03	573793	169164	54.1	48.1	54.6	53.9	46.3	52.9	47.1	44.6	55.2	53.1	61.7	46.5	51.5	**40.2**		
DT04	576565	167336	44.2	38.1	50.2	36.7	35.9	28.6	32.7	26.2	41.4	38.7	46.5	40.1	38.3	29.9		
DT05	577426	166506	38.7	25.3	34.3	37.1	21.4	29.7	30.1	21.7	35.4	32.7	40.8	33.5	31.7	24.7		
DT06	574589	168087	54.1	52.8	53.2	48.8	45.5	50.6	50.2	41.2	65.1	61.3	59		52.9	**41.3**		
DT07	573078	168908	38.5	25.3	42.3	36.5	35.9	38.8	36.1	31.6	43.7		43.2	35.1	37.0	28.9		
DT08	575642	167779	42.7	43.3	39.9	39.3	43.1	38	42.3	33.7	48.8	46.9	43.4	40.6	41.8	32.6		
DT09	577434	166993	30.8	24.8	30.5	21.1	22.3	24.8	20.8	18.3	28.6	30	36.3	27.1	26.3	16.8		Adjusted using local bias adjustment
DT10	575681	167691	40.1	39.3	33.6	30.5	33.7	24.6	30.4	24.5	41.5	42.3	38.2	30.4	34.1	26.6		
DT11	576393	167495	39.9	37	44.1	28.6	39.1	31.9	33.7	27.3	42.6	41.9	39.1	36.4	36.8	28.7		
DT12	573865	169646	40.7	40.5	38.6	31.8	34.4	25	29.2	25	40.4	38.6	37.1	38.6	35.0	27.3		
DT13	583152	176305	33.8	19.1	18.2	12.1	12.1	13.3	10.9	8.1	15.4	18.2	23.8	19.6	17.1	12.3		Adjusted using local bias adjustment
DT15	581709	165922	37.9	34.9	39.1	41.4	32.6		36.3	30	44	37.8	43.8	33.5	37.4	29.2		
DT16	581843	165886	35.4	24.8	31.9	24.9		22.4	23.6	20.4	26.6	28.4	38	26.6	27.5	21.5		
DT17	577768	166922	47.8	40.2	46.3	40	37.6	39.5		32.1	44.6	48	58.6	45.5	43.7	34.1		
DT18	576508	167404	53.8	48.9	58.7		47.6			32.6	51.1	52.1	54.5	48.9	49.8	38.8	36.6	
DT19	573329	169294	54.8	48.1	52.2	43.6	47	41.3	42.7	35.2	53.9	55	52.9	46.2	47.7	37.2		
DT20	573168	169305	56.3	52.2	62.1	45	47	45	47.1	37.8	53.9	56.5	58.2	50.8	51.0	39.8	30.5	
DT21	574999	170882	28.3	24.1	22.8	23.8		20.5	17.7	12.5	24.7	23.9	24.8	22.4	22.3	17.4		
DT22	575488	171616	35.9	32.8	35.1	30.8	32.8	31	29.9	28.4	35	33.2	38.7	34.7	33.2	25.9		
DT23	575044	171351	29	26.3	25.4	26.3	24.8	24.7	22.6	18.3	29.8	26.2	26.5	23.4	25.3	19.7		
DT24	575948	171847	64.6	57.8	61.1	46.1	56	59.4	54.7	45.7	64.9	71.1	66.3	55.4	58.6	**45.7**	36.8	
DT25	577908	169285	46.6	39.3	42.5	36.6	33.9	32.4	33.5	29.3	38.7		34.6	26.3	35.8	27.9		
DT26	578007	169262	32.3	25.3	28.3	20.5	15.1	26.1	22.2	16.2	26.3	19	46.3	37.9	26.3	20.5		
DT27	577880	169319	43.6		42.1	43.8	34.3	40.8		25.7	38.4				38.4	31.4		
DT28	575737	167670	45.2	41.7	48.3	49.6	43.4	49.7	43.8	32.8	46.4	40.8	48.5	21.2	42.6	33.2		
DT29	574760	167892	40.9	36.7	43.9	35.6	33.2	30.7	28.1	26.9	38.9	39.5	46.6	37.4	36.5	28.5		
DT30	575473	167837	43.6	38.9	38.8	42,3	37.6	37.8	34.4	28.1	49.4	39.5	47.6	41.9	39.8	31.0		
DT31	574788	164568	30.7	22.2	24.6	16.9	17.9	16.3	17.5	14.6	22.9	29.5	29.2	24.7	22.3	17.4		
DT32	575903	171802	52.1	51.3	52.1	46.8	45.1	48.4	36	38.3	52.3	57.8	56.3	49.8	48.9	38.1	29.5	
DT33	575971	171833	60.2	48.3	56.4	39.6	42.1	41.1	41.3	31.4	49.4	53.3	56.2	49	47.4	36.9	32.9	
DT34	574499	168495	40.4	33.8				12.7	32.1		44.7	37.7	40.9	37.3	35.0	25.9		
DT35	573518	169176	45	40.1	31.9	34.6	31.6	31.4	33.8	27	41.8	39.8	41.9		36.3	28.3		
DT37	575862	168104	42.1	34.7	42.6	43.1	30.5	39.4	34	31.6	44.4	40.3	30.6	41.6	37.9	29.6		
DT38	576056	167835	39.6	35.2	38.8	31.2	30	25.2	28.7	26.8	41.3	36.8	38.8	34.1	33.9	26.4		
DT39	576084	167762	38.4	37.6	40.1	30.8	32.6	31.1		28.7	38.1	39.3	47.7	38	36.6	28.5		
DT40	570615	166065	54.1	48.5	44	36.5		33.8	34.8	30.1	41.5	43.3	46.3	38.4	41.0	32.0		
DT41	570281	164949	32.7	23.4	27.2	18.2	19	20.3	19.2	13.1	26.3	28.2	27.5	23.5	23.2	18.1		
DT42	570276	165016	24	24.2	22.1	15.1	14.9	14.6	14.9	10.9			24.3	20.5	18.6	14.5		
DT43	570713	169417	31.9	32.5	30.2	30.8	26	22	22.2	18.6	31.3	35.4	39.3	29.3	29.1	22.7		
DT44	573590	169263	45.8	54.2	52.2	43.7	46.2	48.4	47	34.1	53.5	62.8	65	53.1	50.5	39.4	33.8	
DT47	570658	166120	32.4	32.9	28.2	25	26.2	26.2	25.4	15.5	27.6	30.4	28.5	30.1	27.4	21.3		
DT48	571255	166993	44.7	44.8	44.2	39.3	38.9	39.3	39	36.3	43.6	45.7	46.4	37.1	41.6	32.5		
DT49	574554	171351										27	30.4	26.6	28.0	18.8		Installed in October 2021
DT50	574568	171357										26.8	31.5	20.5	26.3	17.7		Installed in October 2021

☐ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1**.

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.**

☒ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column.**

☐ **Medway Council confirm that all 2021 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**.

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

New or Changed Sources Identified Within Medway Council During 2021

Medway Council has not identified any new sources relating to air quality within the reporting year of 2021. Table C.1 presents the Medway Council has identified the following development proposals as sources which could have an impact on the local air quality in the area.

Table C.2 – Planning applications received in 2021

ID	Name
MC/21/3380	STREET RECORD VIEW ROAD CLIFFE WOODS ROCHESTER MEDWAY
MC/21/3086	41-43 HIGH STREET RAINHAM GILLINGHAM MEDWAY ME8 7HS
MC/21/0503	39 RAILWAY STREET CHATHAM MEDWAY ME4 4RH
MC/21/2493	STREET RECORD STATION ROAD RAINHAM GILLINGHAM MEDWAY
MC/21/2265	35 RAINHAM ROAD GILLINGHAM MEDWAY ME7 5LS
MC/20/2263	THE GREEN LION 104 HIGH STREET RAINHAM GILLINGHAM MEDWAY ME8 8AD
MC/21/0936	346A HIGH STREET CHATHAM MEDWAY ME4 4NP
MC/21/1157	3 OLD ROAD CHATHAM MEDWAY ME4 6BJ
MC/21/0370	100-110 HIGH STREET, STROOD, ME2 4TS
MC/21/0564	STREET RECORD OLD ROAD CHATHAM MEDWAY
MC/21/0502	35 RAILWAY STREET CHATHAM MEDWAY ME4 4RH
MC/21/0585	59 NEW ROAD CHATHAM MEDWAY ME4 4QR
MC/20/2598	133 LUTON ROAD LUTON CHATHAM MEDWAY ME4 5AE
MC/21/0085	55 MEDWAY ROAD GILLINGHAM MEDWAY ME7 1NL
MC/20/2601	THE GREEN LION 104 HIGH STREET RAINHAM GILLINGHAM MEDWAY ME8 8AD
MC/20/3312	185 FRINDSBURY ROAD STROOD ROCHESTER MEDWAY ME2 4JN
MC/20/2946	BULLS HEAD 2 LONDON ROAD STROOD ROCHESTER MEDWAY ME2 3HT
MC/20/3318	42 NEW ROAD CHATHAM MEDWAY ME4 4QR
MC/21/3499	26-28 HOATH LANE, RAINHAM, GILLINGHAM, ME8 0SW
MC/21/3333	5 OTWAY TERRACE, CHATHAM, ME4 5JU
MC/21/3311	THE WINDMILL, RATCLIFFE HIGHWAY, HOO ST.WERBURGH, ROCHESTER, ME3 8QB
MC/21/2612	THE HOLLIES AND SOUTHVIEW, SHARNAL STREET, HIGH HALSTOW, ROCHESTER, ME3 8QR
MC/21/1825	NATIONAL GRID GRAIN LNG TERMINAL, GRAIN ROAD, ISLE OF GRAIN, ROCHESTER, ME3 0AB
MC/21/1776	GARAGES AND STORE ROOM, REAR OF 44 BANK STREET
MC/20/3293	18 BROOM HILL ROAD AND LAND TO REAR STROOD, ROCHESTER, ME2 3LE
MC/20/3245	UNIT B2 WHITEWALL ROAD, MEDWAY CITY ESTATE, ROCHESTER, ME2 4DZ
MC/21/0355	BERKELEY MOUNT, OLD ROAD, CHATHAM, ME4 6BW
MC/21/0302	LAND SOUTH OF BERWICK WAY, EAST OF FRINDSBURY AND NORTH AND WEST OF PARSONAGE LANE (KNOWN AS MANOR FARM), FRINDSBURY, ROCHESTER

ID	Name
MC/20/2782	EXISTING PUBLIC CAR PARKING SITE, BORDERED BY THE BROOK,QUEEN STREET, SLICKETTS HILL AND CROSS STREET
MC/21/2839	FRINDSBURY HOUSE, 42 HOLLYWOOD LANE, WAINSCOTT, ROCHESTER, ME3 8AL
MC/21/0440	MEDWAY BRIDGE MARINA, MANOR LANE, ROCHESTER, ME1 3HS
MC/21/0375	LAND ADJACENT TO NO.9 ROCHESTER ROAD, CUXTON, ROCHESTER, ME2 1AD
MC/20/3237	MOUNTBATTEN HOUSE, MILITARY ROAD, CHATHAM
MC/21/0537	LAND BETWEEN CHATHAM HILL AND MOUNT, CHATHAM, ME4 4PA
MC/21/0603	287-289 HIGH STREET, CHATHAM, ME4 4BN
MC/20/2738	KINGSNORTH POWER STATION, POWER STATION ACCESS ROAD, HOO ST.WERBURGH, ROCHESTER, ME3 9NQ
MC/20/3291	LAND AT THE MALTINGS, RAINHAM
MC/21/0211	1A MILTON ROAD, GILLINGHAM, ME7 5LP
MC/21/0103	163 GRANGE ROAD, GILLINGHAM, ME7 2TL
MC/20/2980	LAND OFF LODGE HILL LANE, CHATTENDEN,
MC/21/0640	MBS HOUSE, BREDGAR ROAD, GILLINGHAM, ME8 6PL
MC/21/0412	KITCHENER BARRACKS, DOCK ROAD, CHATHAM, ME4 4UG
MC/21/0675	24 GUN LANE, STROOD, ROCHESTER, ME2 4UJ
MC/21/0429	FORMER GRAYS OF CHATHAM SITE, 1-33 HIGH STREET (EXCLUDING 21), CHATHAM, ME4 4EN
MC/21/0387	27 THE PADDOCK, CHATHAM, ME4 4RE
MC/21/0674	26-28 HOATH LANE, RAINHAM, ME8 0SW
MC/21/1086	LAND SOUTH OF BRITANNIA ROAD, HIGH HALSTOW
MC/21/0922	221 LORDSWOOD LANE, LORDSWOOD, CHATHAM, ME5 8JU
MC/21/1221	LAND OFF CITY WAY (FORMER PLAYING FIELD), CHATHAM, ME1 2AE
MC/21/1004	LAND WEST OF LAYFIELD ROAD, GILLINGHAM, ME7 2QY
MC/21/1245	MEDWAY BRIDGE MARINA, MANOR LANE, ROCHESTER, ME1 3HS
MC/21/1531	CORY'S ROAD / RIVERSIDE WALK, ROCHESTER RIVERSIDE (PHASE 4), ROCHESTER, ME1 1NH
MC/20/1667	DURLAND HOUSE, 160 HIGH STREET, RAINHAM, ME8 8AT
MC/21/1694	LAND SOUTH OF VIEW ROAD, CLIFFE WOODS
MC/21/1891	82 JEFFERY STREET, GILLINGHAM, ME7 1DB
MC/21/2101	LLOYDS BANKING GROUP OPERATIONS CENTRE, BAILEY DRIVE, GILLNGHAM BUSINES PARK, GILLINGHAM, ME8 0PZ
MC/21/1889	UNIT 1A LONDON MEDWAY COMMERCIAL PARK, JAMES SWALLOW WAY, HOO ST.WERBURGH, ROCHESTER, ME3 9GX
MC/21/2271	209-217 HIGH STREET, ROCHESTER, ME1 1HB
MC/21/2312	163 MAIN ROAD, HOO ST.WERBURGH, ROCHESTER, ME3 9EY
MC/21/2272	LAND NORTH OF QUEEN STREET, CHATHAM, ME4 4LU
MC/21/2328	LAND SOUTH OF BUSH ROAD, CUXTON, ROCHESTER
MC/21/2861	SOUTHERN BELLE, 170 HIGH STREET, GILLINGHAM, ME7 1AJ
MC/21/3055	STROOD SERVICE STATION, 3 LONDON ROAD, STROOD, ROCHESTER, ME2 3HX
MC/21/2599	MC AIRFILTRATION, MOTNEY HILL ROAD, RAINHAM, ME8 7TZ
MC/21/0954	LAND TO REAR OF EDEN MEADOW, NEWINGTON, ME9 7JH
MC/21/0979	KINGSNORTH POWER STATION, POWER STATION ACCESS ROAD, HOO ST.WERBURGH, ROCHESTER, ME3 9NQ
MC/21/0569	GROVE HOUSE, GRAIN ROAD, MIDDLE STOKE, ROCHESTER, ME3 9RS
MC/21/1286	LAND ADJACENT TO B2097 MAIDSTONE ROAD, ROCHESTER, ME1 3AU
MC/21/1520	LAND AT EAST HILL, CHATHAM
MC/21/1296	GIBRALTAR FARM, HAM LANE, HEMPSTEAD, GILLINGHAM, ME7 3JJ
MC/21/1899	CHATHAM HOUSE, 14 NEW ROAD, CHATHAM
MC/21/2225	LAND AT EAST OF SEYMOUR ROAD AND NORTH OF LONDON ROAD, RAINHAM
MC/21/2063	FORMER CUXTON PIT NO. 2, ROMAN WAY, STROOD, ME2 2NU
MC/21/2292	BAE SYSTEMS, MARCONI WAY, ROCHESTER, ME1 2XX
MC/21/2291	BAE SYSTEMS, MARCONI WAY ROCHESTER, ME1 2XX
MC/21/2710	H E SERVICES (PLANT HIRE) LTD, WHITEWALL ROAD, MEDWAY CITY ESTATE, ROCHESTER, ME2 4DZ
MC/21/3505	110 FRINDSBURY ROAD, STROOD, ROCHESTER, ME2 4JB

QA/QC of Diffusion Tube Monitoring

The diffusion tubes for 2021 were supplied and analysed by SOCOTEC Didcot utilising the 50% Triethanolamine (TEA) in acetone preparation method. SOCOTEC Didcot is a UKAS accredited laboratory which participates in the WASP scheme.

Diffusion Tube Annualisation

Results were annualised in line with guidance included in Box 7.9 and 7.10 of the LAQM.TG(16) for monitoring sites DT27, DT34, DT49 and DT50 as data capture was below 75%.

Monitoring concentrations from Rochester Stoke (ROCH), London Bexley (BEX), and Thurrock (THUR) background automatic monitoring stations were used to derive the adjustment factors. All monitors are in background locations and had a data capture above 85% in 2021. They are all managed by the Automatic Urban and Rural Network (AURN), and ratified data was downloaded from the Air Quality England website[9]. Table C.1 details the calculations used to derive the annualisation factors for DT27, DT34, DT49 and DT50. The calculations led to the use of annualisation factors of 1.04, 0.95, 0.86 and 0.86 for DT27, DT34, DT49 and DT50 respectively.

Table C.1 – Annualisation Summary (concentrations presented in µg/m^3)

Diffusion Tube ID	Annualisation Factor Rochester Stoke	Annualisation Factor London Bexley	Annualisation Factor Thurrock	Average Annualisation Factor	Raw Data Simple Annual Mean (µg/m^3)	Annualised Data Simple Annual Mean (µg/m^3)
DT27	1.0755	1.0332	1.0354	1.0480	38.4	40.2
DT34	0.9143	0.9688	0.9618	0.9483	35.0	33.1
DT49	0.8438	0.8702	0.8733	0.8624	28.0	24.1
DT50	0.8438	0.8702	0.8733	0.8624	26.3	22.7

[9] https://www.airqualityengland.co.uk/

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2021 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_X/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Medway Council have applied local bias adjustment factors to the 2021 monitoring data recorded at DT09 and DT13 non-automatic co-located monitoring locations. Both DT09 and DT13 recorded concentrations from triplicate diffusion tubes. The triplicate monthly means were calculated to provide monthly means for the co-located site. For DT09, 12 months of monitoring data was captured to use for the bias calculation. For DT13, 10 months of monitoring data was captured to use for the bias calculation. A bias adjustment factor of 0.72 was calculated for DT09 and a bias adjustment factor of 0.64 was calculated for DT13.

A national bias adjustment factor of 0.78 was applied to the 2021 monitoring data recorded at all remaining non-automatic monitoring stations. 22 studies contributed towards the calculation of this national bias adjustment factor.

A summary of bias adjustment factors used by Medway Council over the past five years is presented in Table C.2. Table C.3 presents the local bias adjustment calculations.

Table C.2 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	03/22	0.78
	Local	-	0.72 (DT09) and 0.64 (DT13)
2020	National	03/21	0.77
	Local	-	0.71 (DT09) and 0.51 (DT13)
2019	National	09/20	0.75
	Local	-	0.74 (DT09) and 0.64 (DT13)
2018	National	03/19	0.76
	Local	-	0.75 (DT09) and 0.63 (DT13)
2017	National	03/18	0.77
	Local	-	0.68

Table C.3 – Local Bias Adjustment Calculation

	Local Bias Adjustment DT09	Local Bias Adjustment DT13
Periods used to calculate bias	11	12
Bias Factor A	0.64 (0.58 - 0.71)	0.72 (0.69 - 0.76)
Bias Factor B	56% (41% - 72%)	38% (32% - 45%)
Diffusion Tube Mean (µg/m^3)	16.9	26.338
Mean CV (Precision)	9.9%	6.4%
Automatic Mean (µg/m^3)	10.8	19.0
Data Capture	99%	99%
Adjusted Tube Mean (µg/m^3)	11 (10-12)	19 (18-20)

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table C.4.

A number of the roadside diffusion tube monitoring sites measuring nitrogen dioxide concentrations in 2021 were not located at sites of relevant public exposure. As such, it is necessary to distance correct the measured concentrations at these sites in order to estimate concentrations experienced at the nearest relevant exposure to these sites. These estimated concentrations can then be compared to the relevant AQO to establish whether or not an exceedance is likely to have taken place. The sites which required a distance correction calculation to be undertaken included DT18, DT20, DT24, DT32, DT33 and DT44.

Distance correction calculations have been undertaken for each nitrogen dioxide monitoring site that is not representative of relevant exposure using Defra's 'Diffusion Tube Data Processing Tool v2.0', which requires the following inputs:

- distance from the monitoring site to the kerb (m);
- distance from the closest relevant exposure to the kerb (m);
- the local annual mean background nitrogen dioxide concentration (µg/m^3), determined using Defra's background maps; and
- the measured annual mean nitrogen dioxide concentration at the site (µg/m^3)

Table C.4 – NO_2 Fall off With Distance Calculations (concentrations presented in $\mu g/m^3$)

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
DT18	1.8	2.8	38.8	16.6	*36.6*	Predicted concentration at Receptor within 10% the AQS objective.
DT20	1.7	8.4	39.8	14.1	30.5	
DT24	0.5	2.7	45.7	16.0	*36.8*	Predicted concentration at Receptor within 10% the AQS objective.
DT32	1.9	10.3	38.1	16	29.5	
DT33	1.8	4.2	36.9	16	32.9	
DT44	2.0	5.7	39.4	16.5	33.8	

QA/QC of Automatic Monitoring

The Chatham (AURN) monitoring site is calibrated every two weeks and the Rochester Stoke (AURN) monitoring site every three months.

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

The type of PM_{10} and $PM_{2.5}$ monitor(s) utilised within Medway Council do not require the application of a correction factor.

Automatic Monitoring Annualisation

All automatic monitoring locations within Medway recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

Appendix D: Location of monitoring sites and AQMAs

Figure D.1 – Map of Automatic Monitoring Sites

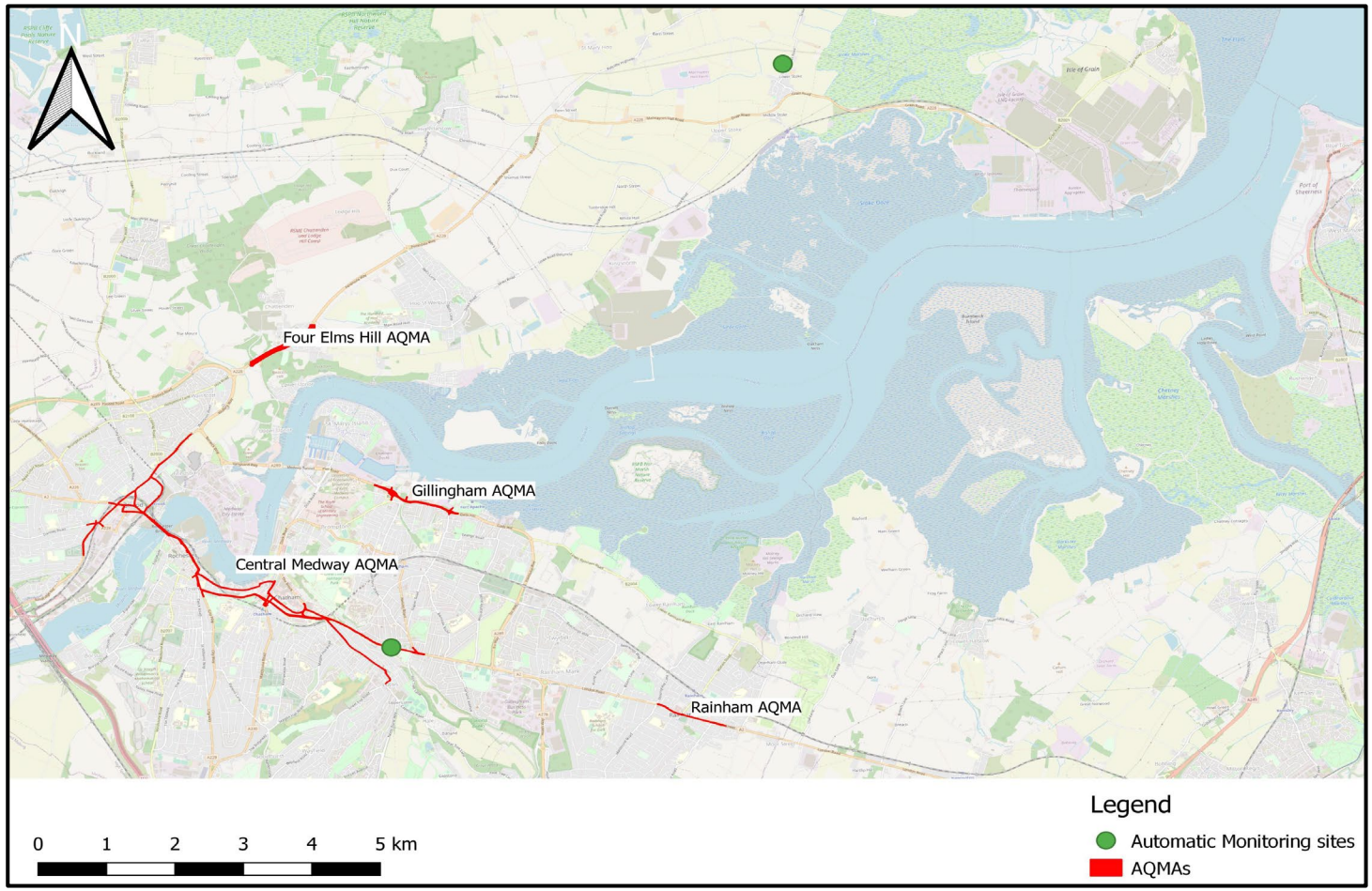


Figure D.2 – Map of Non-Automatic Monitoring Sites – All sites

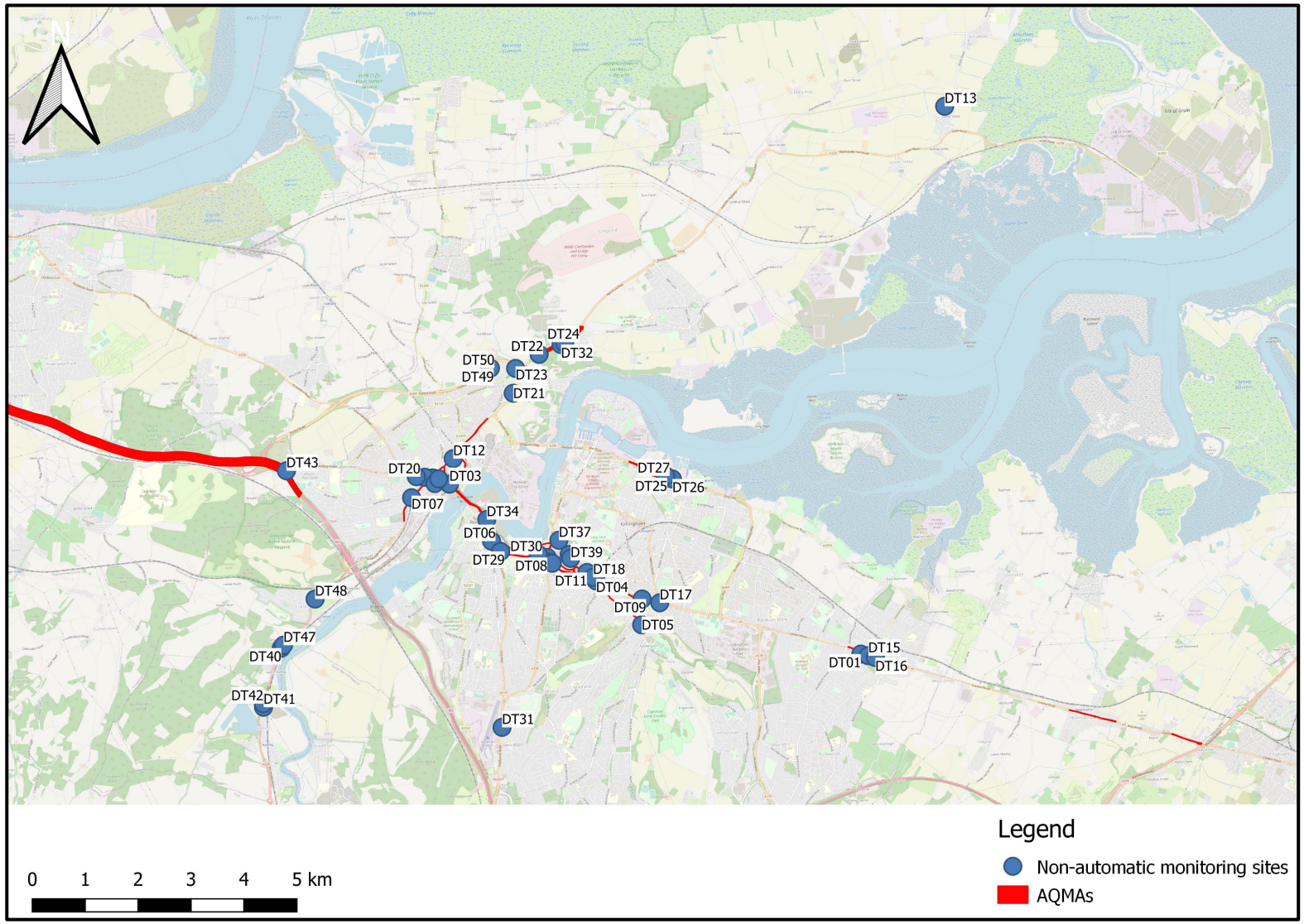


Figure D.3 – Map of Non-Automatic Monitoring Sites within Central Medway AQMA

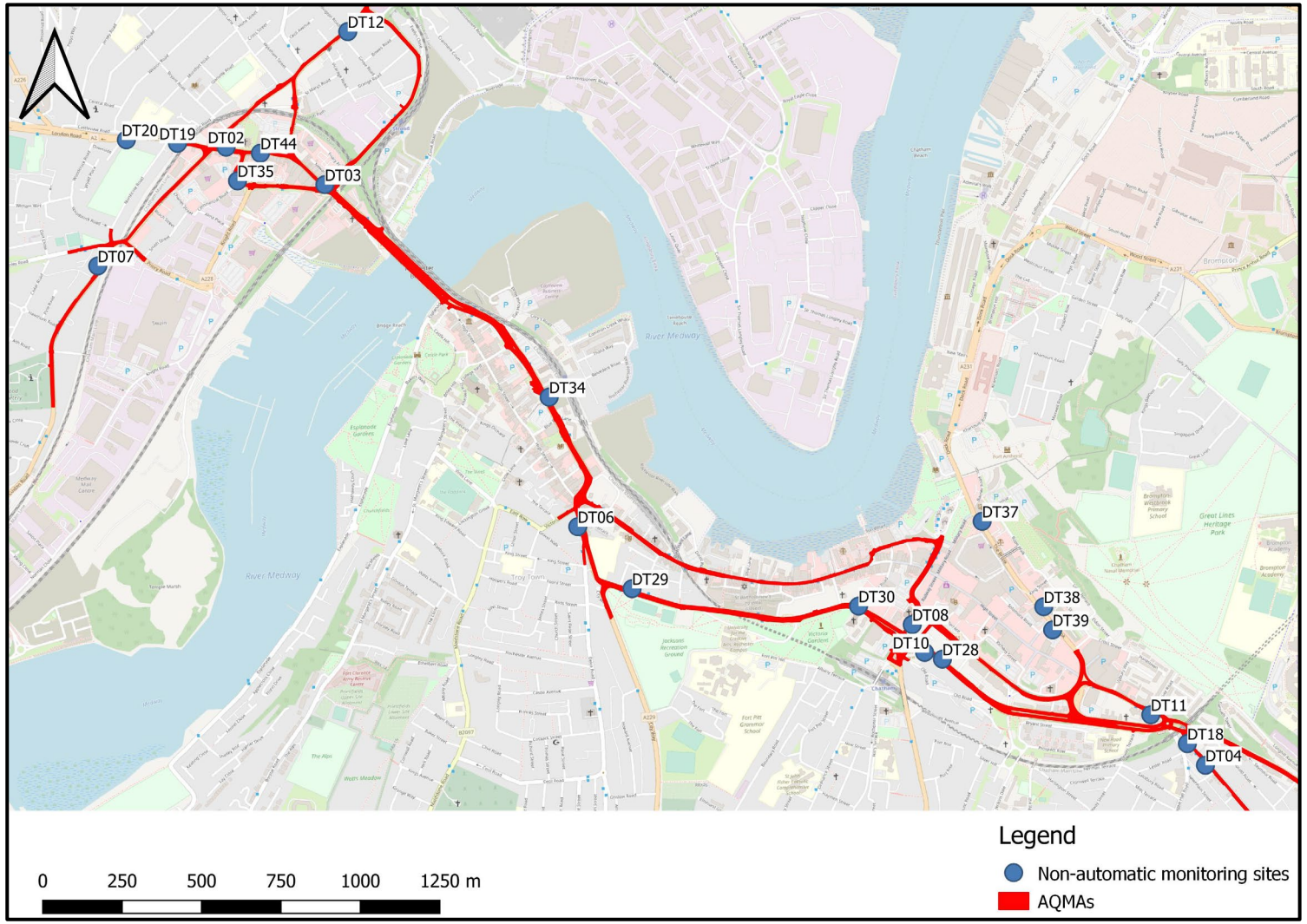


Figure D.4 – Map of Non-Automatic Monitoring Sites within Four Elms Hill AQMA

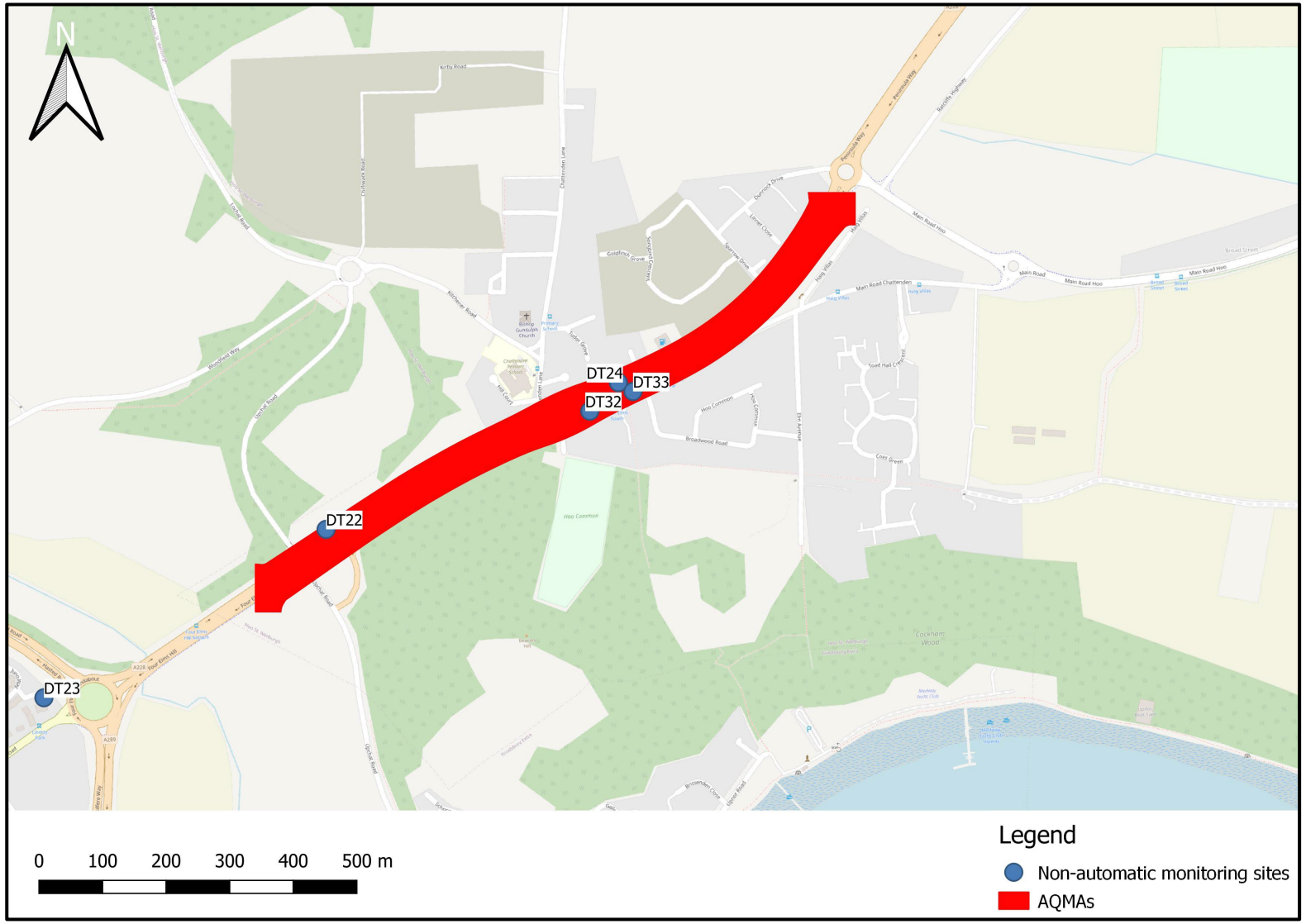


Figure D.5 – Map of Non-Automatic Monitoring Sites within Gillingham AQMA

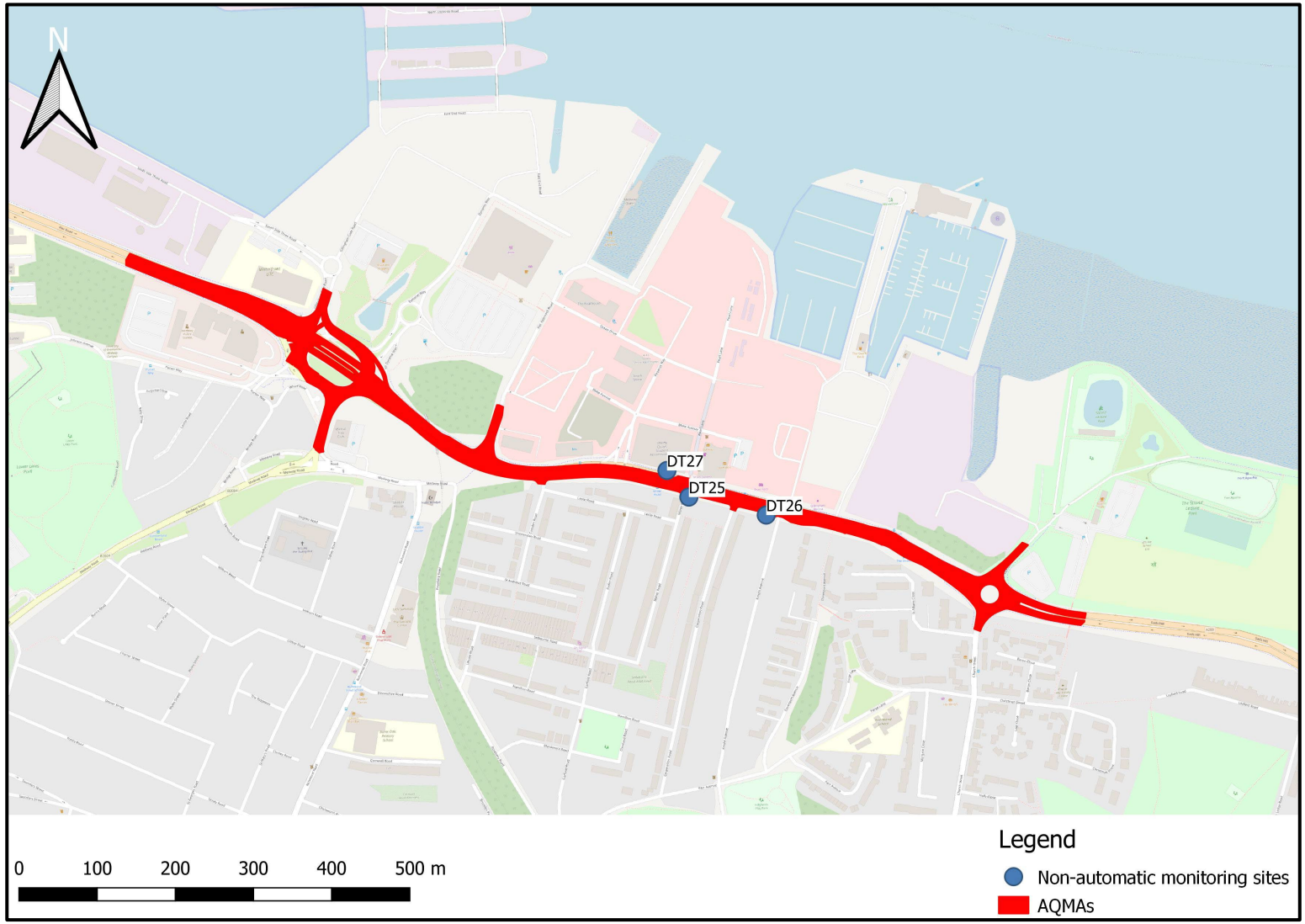
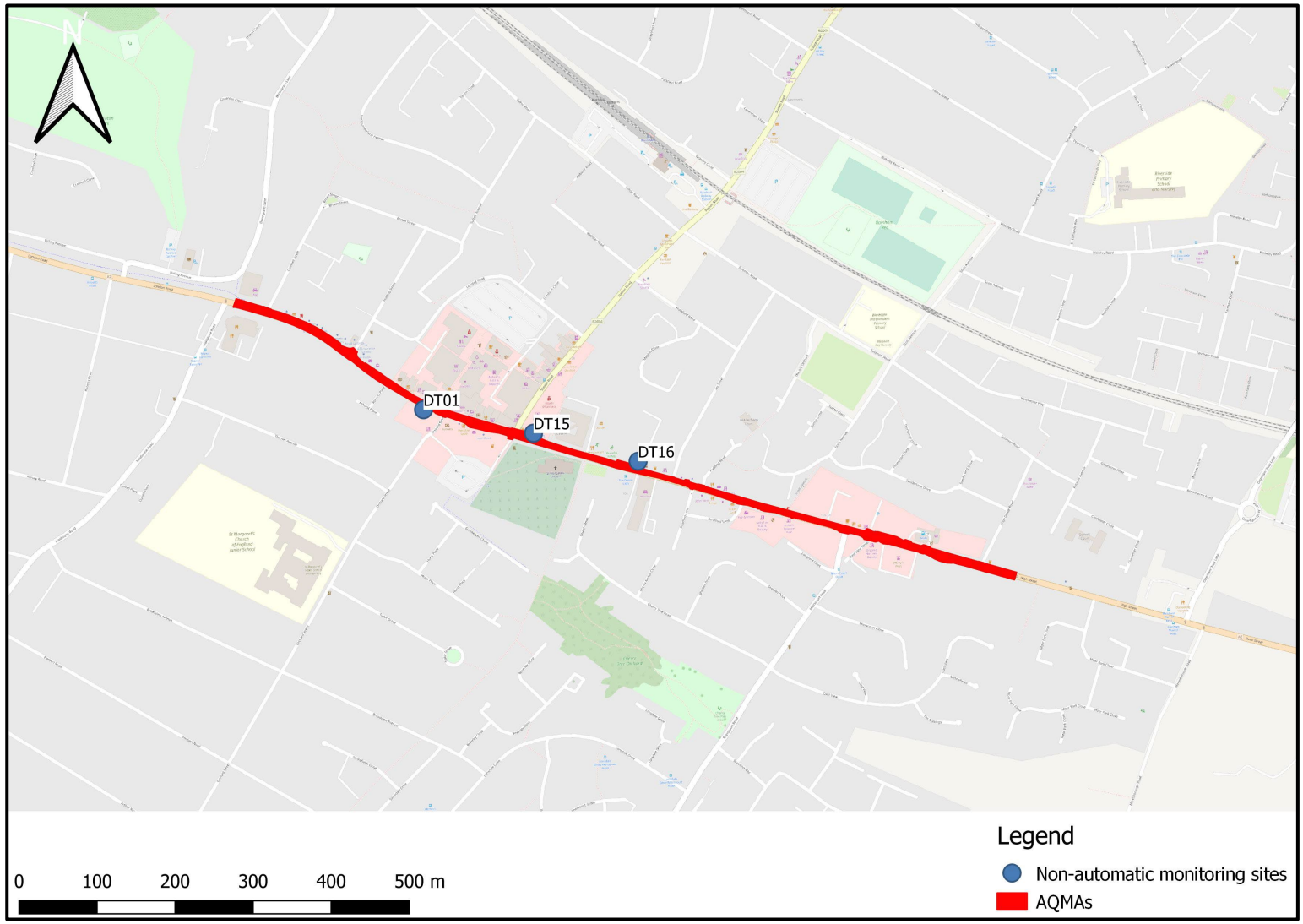


Figure D.6 – Map of Non-Automatic Monitoring Sites within Rainham AQMA



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[10]

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM_{10})	40µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[10] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

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